

WHAT IS CLAIMED IS:

1. Method for providing a sensor system in a communication device comprising the steps of:
 3. providing an electromechanical dielectric (EMD) film integral with the surface of the cover of the communication device;
 5. providing one or more voided areas in the outer surface regions in the cover for accessing the EMD film wherein the voided area corresponds to the operational function to be implemented; and
 8. coupling the EMD film in each of the exposed regions to electronic circuit means associated with the corresponding operational function of the communication device.
1. The method as defined in claim 1, wherein the step of providing one or more voided areas in the outer surface region includes providing one or more voided areas in the inner surface region of the cover in those areas where the EMD film requires unobstructed movement to perform the desired operational function of transforming an acoustic energy signal to a corresponding electrical signal and transforming an electrical signal to a corresponding acoustic signal.
1. The method as defined in claim 1, further including the step of providing a display in one of the voided areas with the rear surface of the display facing and in contact with the EMD film.
1. The method as defined in claim 1, wherein the step of providing the EMD film integral with the surface of the cover includes the step of injection molding the cover with the EMD film.

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1 5. A communication device comprising:
2 an electromechanical dielectric (EMD) film coextensive with at least
3 a portion of the surface of a cover of the communication device;

4 one or more voided areas in the outer surface regions in the cover for
5 accessing a portion of the EMD film wherein a given voided area in the
6 surface of the cover corresponds to the operational function to be
7 implemented;

8 electronic circuit means coupled to the EMD film for sensing
9 electrical signals generated by the EMD film in response to exposure to a
10 force and for displacing the surface of the EMD film with respect to a plane
11 passing through and coextensive with the surface in response to electrical
12 signals generated by the electronic circuit means.

1 6. A communication device as defined in claim 5, wherein the EMD
2 film functions as a speaker.

1 7. A communication device as defined in claim 5, wherein the EMD
2 film functions as a microphone.

1 8. A communication device as defined in claim 5, wherein the EMD
2 film functions as a keypad.

1 9. A communication device as defined in claim 5, further comprising a
2 display in contact with the EMD film whereby the EMD film is responsive
3 to sensing a direction of touching on the surface of the display.

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1 10. A portable, handheld communication device of the type having means
2 for establishing a communication link between itself and a remote
3 communication device comprising:

4 a case having at least a first portion molded from material responsive
5 to displacement for generating an electric signal; and

6 at least a second portion molded from material responsive to electric
7 signals for displacement of said material proportional to the magnitude of the
8 electrical signal.

1 11. A portable, handheld communication device as defined in claim 10,
2 wherein said first portion and said second portion are molded from
3 electromechanical dielectric (EMD) film, said EMD film being coextensive
4 with at least a portion of the surface of said case.

1 12. A portable, handheld communication device as defined in claim 11
2 further including security means for controlling access to said device and
3 limiting call completion to an authorized user.

1 13. A portable, handheld communication device as defined in claim 12
2 wherein said security means further includes at least a portion of said EMD
3 film configured as a fingerprint recognition sensor

1 14. A method for providing a touch-sensitive surface functionality in a
2 communication device comprising the steps of:

3 providing an electromechanical dielectric (EMD) film with a first
4 major surface having adhesion properties;

5 placing said first adhesion major surface in contact with a desired
6 location of a surface of the communication device; and

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7 coupling the EMD film to electronic circuit means associated with the
8 corresponding operational function of the communication device.

1 15. The method as defined in claim 14, further including the steps of:
2 providing an EMD film with a second major surface disposed
3 opposite said first major surface, said second major surface having adhesion
4 properties; and

5 locating the EMD film between the cover of the device and a display
6 screen of the device, whereby the EMD film holds the display in place to
7 provide a touch-sensitive screen.

1 16. The method as defined in claim 14, further including the steps of:
2 providing an EMD film with a second major surface disposed
3 opposite said first major surface;

4 providing a flexible protective layer on said second major surface;
5 and

6 attaching the adhesion major surface of the EMD film to a desired
7 location on the surface of the device, whereby the protective layer faces
8 outward for touching contact by a user.

1 17. A communication device having touch-sensitive surface functionality
2 comprising:

3 an electromechanical dielectric (EMD) film with a first major surface
4 having adhesion properties and a second major surface oppositely disposed
5 said first major surface, whereby said adhesion major surface holds said
6 EMD film in contact with a desired location on the surface of the
7 communication device; and

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8 means for coupling said EMD film to electronic circuit means
9 associated with the corresponding operational function of the communication
10 device.

1 18. A communication device as defined in claim 17, further comprising:
2 said EMD film second major surface having adhesion properties; and
3 a display in contact with and held by said EMD film second major
4 surface.

1 19. A communication device as defined in claim 17, further comprising a
2 said EMD film second major surface having a flexible protective layer.